

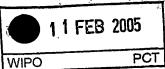


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# **PCT**

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Artcle 36 and Rule 70)

Applicant's or agent's file reference 3FPO-07-05	onofTransmittalofInternationalPreliminary Report (Form PCT/IPEA/416)					
PCT/KR2003/001820	International filing date(day/month/year)  04 SEPTEMBER 2003 (04.09.2003	Priority date (day/month/year) 13 SEPTEMBER 2002 (13.09.2002)				
International Patent Classification (IPC)  IPC7 C12Q 1/68  Applicant	or national classification and IPC					
KOREA RESEARCH INSTIT	UTE OF BIOSCIENCE AND BIO	TECHNOLOGY et al				
and is transmitted to the applicant	amination report has been prepared by this laccording to Article 36.  of 3 sheets, including this coverage.	international Preliminary Examining Authority				
This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).						
These annexes consist of a total	ofsheets.					
3. This report contains indications relating to the following items:  I X Basis of the report  II Priority  III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  IV Lack of unity of invention  V X Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement  VI Certain documents cited  VII Certain defects in the international application  VIII Certain observations on the international application						
Date of submission of the demand	Date of completion	on of this report				
19 JANUARY 2004	(19.01.2004) 26 JANU	JARY 2005 (26.01.2005)				
Name and mailing address of the IPEA Korean Intellectual Proper 920 Dunsan-dong, Seo-gu, Republic of Korea Facsimile No. 82-42-472-7140	v Office	ong UP				



International aplication No.

PCT/KR2003/001820

L	Basi	is of the report
1.	With	regard to the elements of the international application:*
	X	the international application as originally filed
		the description:
		pages , as originally filed
		nages, filed with the demand
		, filed with the letter of
	Ш	the claims: pages
		pages , as originally filed
		pages , as amended (together with any statinger) under Article 19
	-	pages, filed with the letter of, nied with the demand
		the drawings:
		pages, as originally filed
		pages, as originally filed pages, filed with the demand, filed with the demand
		the sequence listing part of the description:
		pages
		pages
		pages, filed with the letter of, nied with the demand
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۷.		i regard to the language, all the elements marked above were available or furnished to this Authority in the language in which international application was filed, unless otherwise indicated under this item.  se elements were available or furnished to this Authority in the following language
		the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
	X.	the language of publication of the international application (under Rule 48.3(b)).
		the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).
3.		h regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international iminary examination was carried out on the basis of the sequence listing:
	X	contained in the international application in written form.
	X	filed together with the international application in computer readable form.
		furnished subsequently to this Authority in written form.
	$\vdash$	furnished subsequently to this Authority in computer readable form
		The statement that the subsequently forminated and the statement that the subsequently forminated and the subsequently formina
	لـــا	The statement that the subsequently furnished written sequence listing does not go beyond the disc losure in the international applicationas as filed has been furinshed.
		The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
4.		The amendments have resulted in the cancellation of:
		the description, pages the claims, Nos.
		4. 3
5.		the drawings, sheets
<b>).</b>		This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box(Rule 70.2(c)).**
	Replace in this c and 70.	ement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to opinion as "originally filed." and are not annexed to this report since they do not contain amendments (Rules 70.16 .17).
** ,	1ny rep	placement sheet containing such amendments must be referred to under item I and annexed to this report.

### INTERNATIONAL PRELIMINARY EXAMINATION

International aplication No.

PCT/KR2003/001820

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.	Statement			
	Novelty (N)	Claims	1-33	<u>Y</u> ES
		Claims	NONE	NO
	Inventive step (IS)	Claims	1-33	YES
l		Claims	NONE	NO
	Industrial applicability (IA)	Claims	1-33	YES
		Claims	NONE	МО

#### 2. Citations and explanations (Rule 70.7)

Claims 1-9 of the present invention relate to a method for screening a mutant lipase having an improved enzymatic activity comprising (1) cloning a lipase gene into a surface display vector; (2) preparing a mutant lipase gene library by mutagenic PCR using the lipase gene in the surface display vector; (3) displaying the mutant lipase gene in the surface of cells by transforming the mutant lipase gene library of the step 2 and surface display vector fragment into host cells; (4) measuring the activity of the mutant lipase displayed in the surface of the transformed host cells and selecting the lipase showing evolved activity. Claims 10-26 relate to mutant lipase protein, a gene and an expression vector characterized in that #219 leucine and/or #278 leucine of Candida antarctica lipase B represented by SEQ. ID. No 14 is replaced by other amino acids. Claims 27-33 relate to a transformant in which the expression vector of claim 20 is introduced to host cells.

#### 1. Novelty

The method for screening a mutant lipase of claims 1-9, mutant lipase protein, a gene and an expression vector of claims 10-26, and a transformant in which the expression vector of claim 20 is introduced to host cells of claims 27-33 are novel compared with the prior art documents cited in ISR [PCT Article 33(2)].

#### 2. Inventive Step

The method for screening a mutant lipase of claims 1-9, mutant lipase protein, a gene and an expression vector of claims 10-26, and a transformant in which the expression vector of claim 20 is introduced to host cells of claims 27-33 are considered inventive since those inventions cannot be easily invented by a person skilled in the art from the prior art [PCT Article 33(3)].

#### 3. Industrial Applicability

Claims 1-33 of the present invention are considered industrially applicable [PCT Article 33(4)].